

REMARKS

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow. After amending the claims as set forth above, claims 1-21 are now pending in this application.

Applicants wish to thank the Examiner for the careful consideration given to the claims.

Rejection of claim 1-18 based on Okamoto

Claims 1-18 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent Application Publication 2001/0014414 ("Okamoto"). For at least the following reasons, this rejection is traversed.

Claim 1 (as amended) recites, among other things, a fuel cell system comprising a fuel gas supply unit; an oxidant gas supply unit; a fuel cell stack; an anode off-gas recirculation unit directly recirculating anode off-gas, discharged from an anode of the fuel cell stack, to the anode; a purging unit temporarily discharging the anode off-gas from the anode off-gas recirculation unit to an outside thereof; a combustor combusting at least the anode off-gas, discharged from the purging unit; and a system controller operative to permit the purging unit to discharge the anode off-gas to the combustor. Okamoto does not teach or suggest this combination of features.

For example, Okamoto does not disclose an anode off-gas recirculation unit. An example of an anode off-gas recirculation unit is shown in Fig. 1 of the present specification in which the anode off-gas recirculation unit is represented by the combination of the anode off-gas recirculation conduit 12 and the recirculation unit 6. (Fig. 1 of the specification.) This anode off-gas recirculation unit directly feeds back anode off-gas to the anode 4 under the control of the purging unit 27. In contrast, Okamoto does not disclose any anode off-gas recirculation unit that directly feeds back anode off-gas to the fuel cell 20 on the exhaust reform gas return line 24b connecting the fuel cell 20 and the combustor 14.¹ (See Fig. 1 of Okamoto.) Indeed, the exhaust air and reform gas from the fuel cell 20 of Okamoto merely flows through pressure regulator valves 26 and 28, through return lines 24a and 24b and into the combustor 14. (See Fig. 1 of Okamoto.) There is no mechanism or element that is

¹ It is noted that the anode off-gas recirculation unit must be fluidly connected between the fuel cell stack and the combustor because the anode off-gas recirculation unit receives gas from the anode of the fuel cell stack and sends it to the purging unit, and the purging unit then sends the gas to the combustor.

capable of directly recirculating the reform gas from the anode of the fuel cell 20 back to the anode because none of the valve 28 and the return line 24b directly recirculates the exhaust reform gas back to the anode. Thus, Okamoto does not teach or suggest this feature.

In addition, Okamoto does not teach the purging unit of claim 1. As previously mentioned, the exhaust air and reform gas from the fuel cell 20 of Okamoto merely flows through pressure regulator valves 26 and 28, through return lines 24a and 24b and into the combustor 14. (See Fig. 1 of Okamoto.) There is no mechanism or element in Okamoto that is capable of discharging the exhaust reform gas from the anode off-gas recirculation unit because Okamoto does not teach such an anode off-gas recirculation unit. Also, Okamoto does not teach or suggest any mechanism that temporarily discharges the exhaust reform gas because the return line 24b and the regulator valve 28 do not temporarily discharge the exhaust reform gas but maintain a permanent flow of exhaust reform gas, even though different pressure levels may be controlled by the valve 28. (Paragraph 0034 of Okamoto.) Thus, Okamoto does not teach or suggest this feature.

Furthermore, Okamoto does not teach the system controller of claim 1 because the system controller of claim 1 is operative to permit the purging unit to discharge the anode off-gas to the combustor, and Okamoto does not teach the purging unit of claim 1. Thus, Okamoto does not teach or suggest this feature.

Because Okamoto does not teach or suggest the anode off-gas recirculation unit, the purging unit, or the system controller of claim 1, claim 1 is allowable over the prior art.

Claims 2-16 depend from and contain all the features of claims 1, and are allowable for at least the same reasons as claim 1, without regard to the further patentable features contained therein.

Claim 17 (as amended) recites, among other things, a fuel cell system comprising a fuel gas supply means; an oxidant gas supply means; a fuel cell stack; an anode off-gas recirculation means for directly recirculating anode off-gas, discharged from an anode of the fuel cell stack, to the anode; a purging means for temporarily discharging the anode off-gas from the anode off-gas recirculation means to an outside thereof; a combustor combusting at least the anode off-gas, discharged from the purging means; and a system control means for operatively permitting the purging means to discharge the anode off-gas to the combustor.

As previously mentioned, Okamoto does not teach or suggest any mechanism or element that is capable of directly recirculating the reform gas from the anode of the fuel cell 20 back to the anode because none of the valve 28 and the return line 24b directly recirculates

the exhaust reform gas back to the anode. Thus, Okamoto does not teach or suggest the anode off-gas recirculation means. Also, Okamoto does not teach or suggest any mechanism that temporarily discharges the exhaust reform gas because the return line 24b and the regulator valve 28 do not temporarily discharge the exhaust reform gas but maintain a permanent flow of exhaust reform gas. Thus, Okamoto does not teach or suggest the purging means. Furthermore, Okamoto cannot teach the system control means for operatively permitting the purging means to discharge the exhaust reform gas to the combustor because Okamoto does not teach the purging means of claim 17.

Because Okamoto does not teach or suggest the anode off-gas recirculation means, the purging means, or the system control means of claim 17, claim 17 is allowable over the prior art.

Claim 18 (as amended) recites, among other things, a method of controlling a fuel cell system comprising: preparing a fuel gas supply unit, an oxidant gas supply unit, a fuel cell stack, and a combustor combusting at least anode off-gas; discharging anode off-gas from the anode of the fuel cell stack; directly recirculating the anode off-gas, discharged from the anode of the fuel cell stack, to the anode; combusting at least the anode off-gas, discharged from the anode of the fuel cell stack; and permitting the anode off-gas to be discharged to the combustor. As previously mentioned, Okamoto does not teach or suggest any mechanism or element that is capable of directly recirculating the reform gas from the anode of the fuel cell 20 back to the anode because none of the valve 28 and the return line 24b directly recirculates the exhaust reform gas back to the anode. Thus, Okamoto does not teach or suggest the step of directly recirculating the anode off-gas to the anode. Because Okamoto does not teach or suggest the step of directly recirculating the anode off-gas of claim 18, claim 18 is allowable over the prior art.

For at least these reasons, favorable reconsideration of the rejection is respectfully requested.

Allowability of claims 19-21

Claims 19-21 depend from and contain all the features of claim 1, 17, or 18, and are allowable for at least the same reasons indicated above, without regard to the further patentable features contained therein. For at least these reasons, allowance of these claims is respectfully requested.

Conclusion

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check or credit card payment form being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicants hereby petition for such extension under 37 C.F.R. §1.136 and authorize payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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